

REMARKS**Status of the Claims**

Claims 1-11 are pending in the application and have been rejected under 35 U.S.C. § 103(a) as being obvious over EP 1 361 243 A1 to Kodama et al. (“Kodama”) in view of U.S. patent no. 5,395,959 to Weyer et al. (“Weyer”).

Rejection Under 35 U.S.C. § 103(a)

Claims 1-11 were rejected under 35 U.S.C. § 103(a) as being obvious over Kodama in view of Weyer. According to the Examiner, Kodama “teaches a method of preparing oxytetramethylene glycol copolymer by copolymerizing tetrahydrofuran and neopentyl glycol in presence of heteropolyacid catalyst.” (Office Action, page 3). The Examiner further states that Kodama “teaches the preparation of oxytetramethylene glycol copolymer, which has a specific number average molecular weight from 800 to 5000 [see claim 1].” (Id.). The Examiner admits that Kodama is “silent on method of determining the molecular weight and termination of polymerization reaction.” (Id.)

Nonetheless, the Examiner asserts that a person having ordinary skill in the art would be motivated to combine the teachings of Kodama with Weyer in order to overcome Kodama’s deficiencies regarding determining the molecular weight and termination of the polymerization reaction. In this regard, the Examiner states, Weyer “teaches a process to produce a polymer having an average molecular weight of from about 500-3,500 dalton [col. 14, lines 27-30], and this reaction system is regulated in the course of reaction by the measurement of the electrical conductivity, which means electrical conductivity is related to molecular weight of polymer.” (Id. at 3-4).

Contrary to the Examiner’s assertion, a person having ordinary skill in the art would not be motivated to practice Applicants’ claimed invention by combining the teachings of Kodama with those of Weyer. As admitted by the Examiner, Kodama fails to contain any teaching regarding determining the molecular weight and termination of the polymerization reaction. In

particular, Kodama does not: (1) correlate termination and molecular weight; (2) disclose any method to terminate the copolymerization; and (3) teach a method to terminate in order to obtain a copolymer having a desired molecular weight, let alone Applicants' specifically claimed molecular weight of "from 1,000 to 2,800." Kodama is, instead, concerned about the content and removal of unreacted diol in the oxytetramethylene copolymer product. Consequently, a reference that is concerned about the removal of a reactant from a product would not motivate a person of skill in the art to attain copolymers of a certain molecular weight (let alone the claimed molecular weight range) by terminating copolymerization by adding water at a certain point nor would it provide a reasonable expectation of success in doing so.

These deficiencies in Kodama are not remedied by the teaching of Weyer. Contrary to the Examiner's assertion, a person having ordinary skill in the art would not be motivated to combine the teachings of Kodama with Weyer in order to obtain a process meeting all of the recitation of Applicants' claim 1. Specifically, Weyer does not teach or suggest adding water to the reaction mixture in order to *terminate* polymerization. To the contrary, Weyer teaches adding water *before* and/or *during* the polymerization (see, e.g., the examples set forth in Weyer). In contrast, Applicants' invention claims distilling water off the reaction mixture (i.e., *removing* water from the reaction mixture) *during polymerization* and subsequently terminating polymerization by adding water. Thus, Weyer teaches away from Applicants' claimed invention.¹

In addition, Applicants have discovered that their claimed process, which includes "terminating the polymerization by adding water when a molecular weight of from 1,000 to 2,800 is attained" provides unexpected benefits with regard to the preservation of heteropolyacid catalyst. For example, as disclosed in Applicants' specification, when reaction is terminated *without adding water* (i.e., by switching off the heating), the recovered heteropolyacid phase became solid after 3 days, could no longer be recycled and could no longer be reused (see Comparative Example 2). Accordingly, for this additional reason Applicants submit that the claims are patentable over Kodama in view of Weyer.

Applicant believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 12810-00095-US from which the undersigned is authorized to draw.

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Respectfully submitted,

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¹ In addition, the calibration curve used by Weyer is different than that disclosed in Applicants' specification. (*See* Fig. 1 of Weyer as compared to Applicants' Fig. 1).